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K Parker

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)
	)
Keeney, et al.	) Examiner: L. Shapiro
	)
Serial No.: 09/748,623	) Art Unit: 2673
	)
Filed: December 22, 2000	)
	)

For: **METHODS AND APPARATUS FOR REPAIRING INOPERATIVE PIXELS IN A DISPLAY**

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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Signature: Carol Prentice
Carol Prentice

RESPONSE TO FINAL OFFICE ACTION

Dear Sir:

This Response is responsive to the final Office Action mailed on May 2, 2003.

Summary

Claims 1-28 are pending.

Claims 1-2, 7-16, and 21-28 stand rejected pursuant to 35 U.S.C. § 103(a) as being unpatentable over Henley (US 5,459,410) in view of Kurogane (US 6,259,424) and Poujois (US 5,274,224).

Claims 3-4, 17-18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Henley, Kurogane, and Poujois in view of Yamakazi (US 6,147,667).

Claims 5 and 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Henley, Kurogane, and Poujois in view of Yang (US 6,392,427).

Claims 6 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Henley Kurogane, and Poujois in view of Anholm (US 5,043,655).

Applicants respectfully traverse the foregoing rejections in view of the following comments.

Discussion of Henley

Henley discloses a method for repairing inoperative pixels by providing redundant TFT drive circuitry for each pixel (Col. 12, lines 13-41).

In contrast, the present invention relates to repair of defective pixels having CMOS drive circuitry. With the present invention, logical repair of the defective pixel is accomplished while avoiding the overhead of a redundant drive circuit as used by Henley.

The Examiner has acknowledged that Henley does not disclose or remotely suggest repairing a defective pixel by connecting an inoperative pixel to the working drive circuitry of a nearby pixel, as set forth in Applicants' claims (Office Action, page 2). Further, the Examiner has acknowledged that Henley does not show a display having CMOS drive circuitry, as claimed by Applicants (Office Action, page 3).

Discussion of Kurogane

The Examiner indicates that Kurogane discloses connecting the driver of one pixel to fix a defect in another pixel (Office Action, page 2). Kurogane discloses a process for building an LCD display using TFT technology. In Kurogane, a defective transistor 1A is not electrically connected to the pixel electrode 2A, and the pixel electrode 2A of the defective pixel 21 A is electrically connected to the pixel electrode of the adjacent

normal pixel 22B (Col. 9, lines 57-64: Figure 7).

The Examiner has apparently disregarded the arguments submitted by applicants in the Amendment filed on March 13, 2003 indicating that Kurogane is limited to connecting the defective pixel to the drive circuit of an immediately adjacent pixel. The Examiner indicates that Applicants' claims do not mention the pixel location. Applicant respectfully submits that Applicants' independent claims specify that the inoperative pixel is connected to the working drive circuitry of a nearby pixel. Therefore, the present invention as claimed is not limited to immediately adjacent pixels. Applicants' claimed invention enables the connection of the inoperative pixel to the working drive circuitry of a nearby pixel. Such a repair strategy is not available in the LCD displays of Kurogane, since there is limited room for routing connections in the LCD layers. The use of CMOS technology provides greater flexibility for connections between layers, thus enabling the repair to be accomplished between nearby pixels as well as adjacent pixels, rather than only adjacent pixels as disclosed in Kurogane.

Kurogane does not disclose or remotely suggest methods which are suitable for connecting the defective pixel to other pixel drives besides that of immediately adjacent pixels.

As discussed in Applicants' March 13, 2003 Amendment, Kurogane is limited to the field of LCD displays built using TFT technology. Applicants' claims are directed towards repairing defective pixels having defective CMOS drive circuitry. The Examiner has acknowledged that Kurogane does not disclose CMOS drive circuitry as claimed by Applicants (Office Action, page 4).

Discussion of Poujois

Poujois discloses an image capture apparatus, such as a retina of a camera, in particular a camera used in the detection

of radiation. Poujois discloses a technique for joining several matrixes edge to edge to form a large matrix for an image capture apparatus. TO accommodate the addressing circuits, certain areas are made inactive by destroying the active elements of pixels in order to install addressing subcircuits in their place. The information normally contained in the destroyed pixels is replaced by reconstituted information obtained by averaging the information of adjacent intact pixels (Abstract).

Poujois does not disclose or remotely suggest methods or apparatus for repairing inoperative pixels in a display, as set forth in Applicants' claims. To the contrary, Poujois discloses repairing the image created where inactive image elements are present in the capture device. In other words, Poujois is directed towards repairing an image resulting from a defective camera retina, while the present invention is directed toward repairing a defective pixel in a display in order to avoid a defective image.

In particular, Poujois discloses repairing an image by averaging information received by the image elements or pixels which surround the inactive image element or pixel (Col., 5, lines 10-14; Col. 6, line 64 through Col. 7, line 39). Poujois reconstructs the data for the defective pixel by averaging the values of the adjacent pixels in order to reconstitute the image after image capture.

The Examiner cites to Poujois as disclosing the use of CMOS drive circuitry in connection with pixel repair. As discussed above, Poujois does not relate to repair of a defective pixel, only repair of the image captured by a device having a defective pixel. Further, Poujois discloses the use of CMOS technology in connection with an image capture device, rather than a display device as claimed by Applicants.

The examiner has indicated that it would have been obvious to combine the disclosure of Henley with that of Kurogane and

Poujois to arrive at the claimed invention. However, Applicants respectfully submit that a straight-forward combination of these technologies would not have been obvious to one skilled in the art at the time of Applicants' invention. Neither Henley nor Poujois relate to repair of defective pixels having defective drive circuitry as claimed by Applicant. Kurogane does not disclose the use of CMOS drive circuitry and is limited to the repair of an immediately adjacent pixel. Henley accomplishes the repair using redundant circuitry.

To combine Henley and Kurogane to arrive at the present invention would require that the disadvantages of using redundant circuitry of Henley be removed, in addition to overcoming the preliminary detection and repair process required by Kurogane. Neither reference teaches how to overcome these issues. Further, one skilled in the art would not be motivated to look to Poujois for teachings relating to pixel repair in a display device, since Poujois teaches only image repair in an image capture device. The combination Kurogane, Henley and Poujois taken as described (and in the absence of the teachings of the present invention) is insufficient to result in the functionality embodied in our invention without further creative thought.

The specific descriptions and reduction to practice Kurogane, Henley and Poujois are too complex and disparate for it to have been obvious how to lift the top level concepts mentioned by the Examiner and to combine them to arrive at the present invention.

Therefore, only with hindsight gained impermissibly from Applicants' disclosure could one of ordinary skill in the art have arrived at the claimed invention from the combination of Kurogane, Henley and Poujois. Moreover, there are no detailed teachings in any of these prior art references that would have motivated or enabled one skilled in the art to combine them as suggested by the Examiner.

Applicants respectfully submit that the present invention would not have been obvious to one skilled in the art in view of the combination of Henley, Kurogane, and Poujois, or any of the other prior art of record.

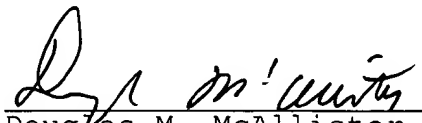
Withdrawal of the rejections under 35 U.S.C. § 103(a) is therefore respectfully requested.

Further remarks regarding the asserted relationship between Applicants' claims and the prior art are not deemed necessary, in view of the above discussion. Applicants' silence as to any of the Examiner's comments is not indicative of an acquiescence to the stated grounds of rejection.

Conclusion

In view of the above, the Examiner is respectfully requested to reconsider this application, allow each of the presently pending claims, and to pass this application on to an early issue. If there are any remaining issues that need to be addressed in order to place this application into condition for allowance, the Examiner is requested to telephone Applicants' undersigned attorney.

Respectfully submitted,



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Art Unit: 2673
Examiner: L. Shapiro

Sir:

Transmitted herewith is:

[X] A Response in the above-identified application (6 pages);

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Very truly yours,

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Attorney Docket No.: **MGI-174**